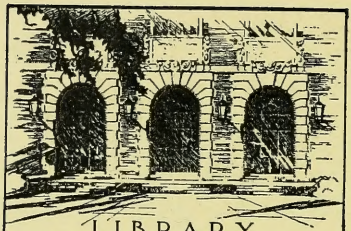
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Entomological Series
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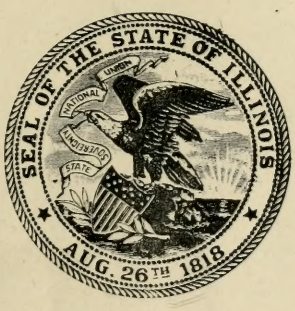
CHINCH-BUG BARRIERS

BY W. P. FLINT
Chief Field Entomologist



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CHINCH-BUG BARRIERS

By W. P. FLINT, Chief Field Entomologist
State Natural History Survey

The use of barriers around wheat fields at harvest-time is one of the best means of killing the first brood of chinch-bugs. That by this means the first-brood bugs may be entirely kept out of the corn and tens of millions of them killed has been proved many times in this and other states. If the weather is unfavorable to the development of the second brood of bugs or the general infestation in the neighborhood is not excessively heavy, most of the protected corn can be saved. Even in the heaviest infestations, corn that has been protected from the first brood can at least be utilized for silage if cut early. If every field of small grain in a chinch-bug infested area could be entirely surrounded by a barrier at harvest-time it might be possible to stop nearly all damage from the insects that season. In actual field practice it has never been found possible to do this, but thousands of acres of corn have been saved by the use of barriers when bugs from the fields of small grain had begun to invade the corn.

If corn has been planted in proximity to a small-grain field which is infested with chinch-bugs it would be folly to allow the first brood to destroy the corn at harvest-time. The corn has then generally reached a height of eight to fourteen inches, and if the bugs are allowed to take it the labor of raising the corn to this stage, the use of the land for the season, and the seed are lost. There is always the possibility that the second brood will be reduced in numbers by unfavorable weather conditions, and do very little damage even when the first brood has been very abundant. For this reason, where it is possible, barriers should always be used to prevent the direct invasion of the corn fields.

The use of barriers is by no means new, but some of the barriers developed during the recent chinch-bug outbreaks in Illinois (1910–1915) have proved more effective than the older types.

Creosote Barrier

Probably the best barrier so far developed, is made by pouring a small stream of crude creosote along the brow of a ridge of earth thrown up around the infested wheat field, with a row of post-holes, twenty feet apart and twelve to eighteen inches deep, at the bottom of

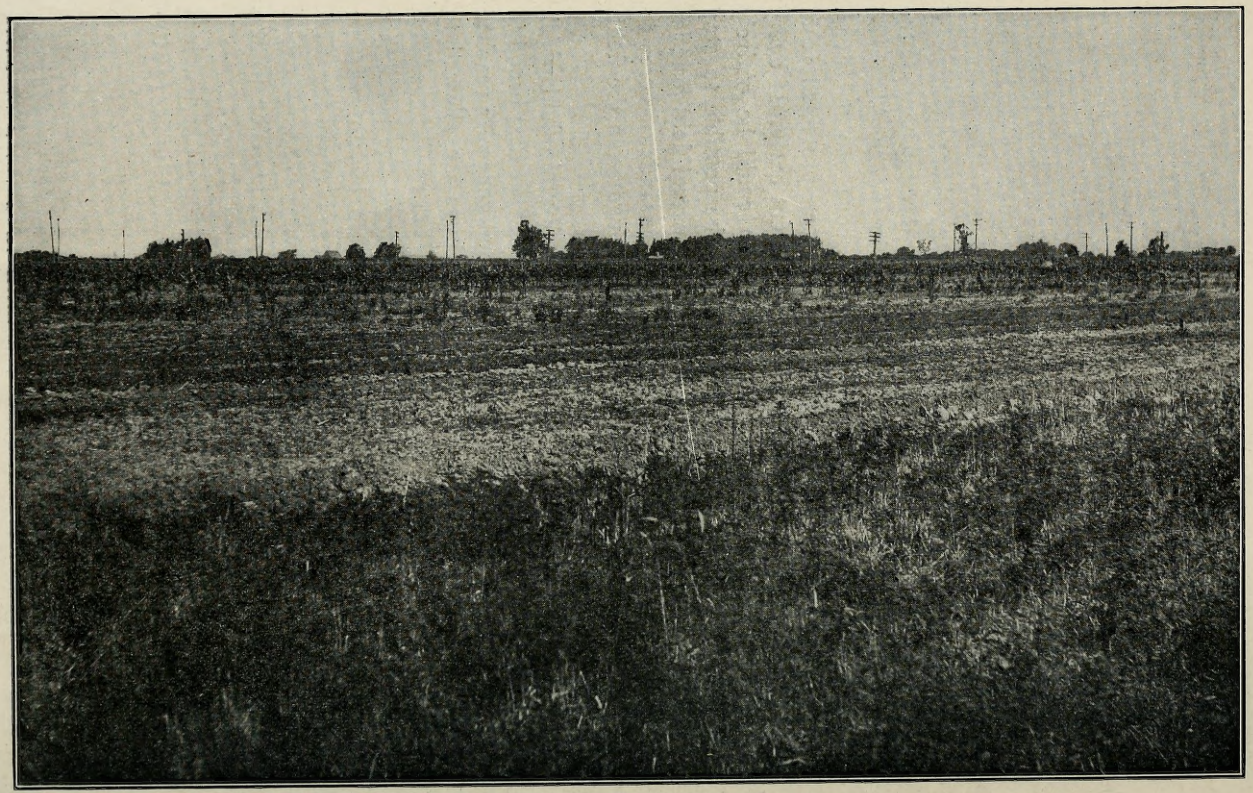

Fig. 1. Field of corn adjoining heavily infested wheat stubble, unprotected at harvest-time. Over 20 acres of corn entirely destroyed.

this ridge on the side toward the wheat, these holes having the tops kept smooth and dusty to catch and hold the bugs. The creosote may be easily applied by making a hole with a six-penny nail in the side and near the bottom of a galvanized or tin bucket, and walking along the side of the barrier, directing the stream to the same place on each application. This should be just at the brow of the ridge on the wheat side, so that the bugs will always have to crawl up to it, and never down. The creosote must be renewed once a day, and this should generally be done about one o'clock p. m., before the bugs are massed against the line. It is the odor of the creosote which prevents them from crossing this barrier, and if the line is renewed when they are massed against it, many become confused by the strong smell of creosote in the air, and run over the line. It will require, on an average, a barrel of creosote for each half mile of barrier maintained for the entire period during which bugs are leaving the wheat stubble.

Creosote for this work can be obtained from the F. J. Lewis Manufacturing Company, of Moline, Ill., or their agents, for thirteen to fourteen cents per gallon in lots of fifty gallons or more, their terms being f. o. b., Moline; from the Barrett Co., St. Louis, at sixteen to twenty cents per gallon (f. o. b., St. Louis) in fifty-gallon orders or over; or from nearly any large dealer in coal-tar products.

Coal-tar Barrier

Coal-tar may be used in much the same manner as creosote, but the ground on which it is poured should be nearly level and compacted as firmly as possible, and a larger quantity will have to be applied. It must be borne in mind that the effectiveness of this barrier depends largely on the sticky character of the material. It will have to be renewed more frequently than the creosote, and at present prices the cost of maintaining a coal-tar barrier would be higher than for maintaining one of creosote.

Kerosene and Salt

A barrier that is effective in stopping the bugs may be made by smoothing a path around the wheat field, and on this placing a narrow ridge of salt moistened with kerosene. The kerosene will have to be applied two or three times a day, and the line will, of course, be entirely destroyed by rain. This barrier will prove more expensive than creosote, but the materials for making it are always easily obtained.

Dusty Barrier

The oldest kind of barrier in use against the chinch-bug is made by dragging a log or a trough of planks back and forth around the

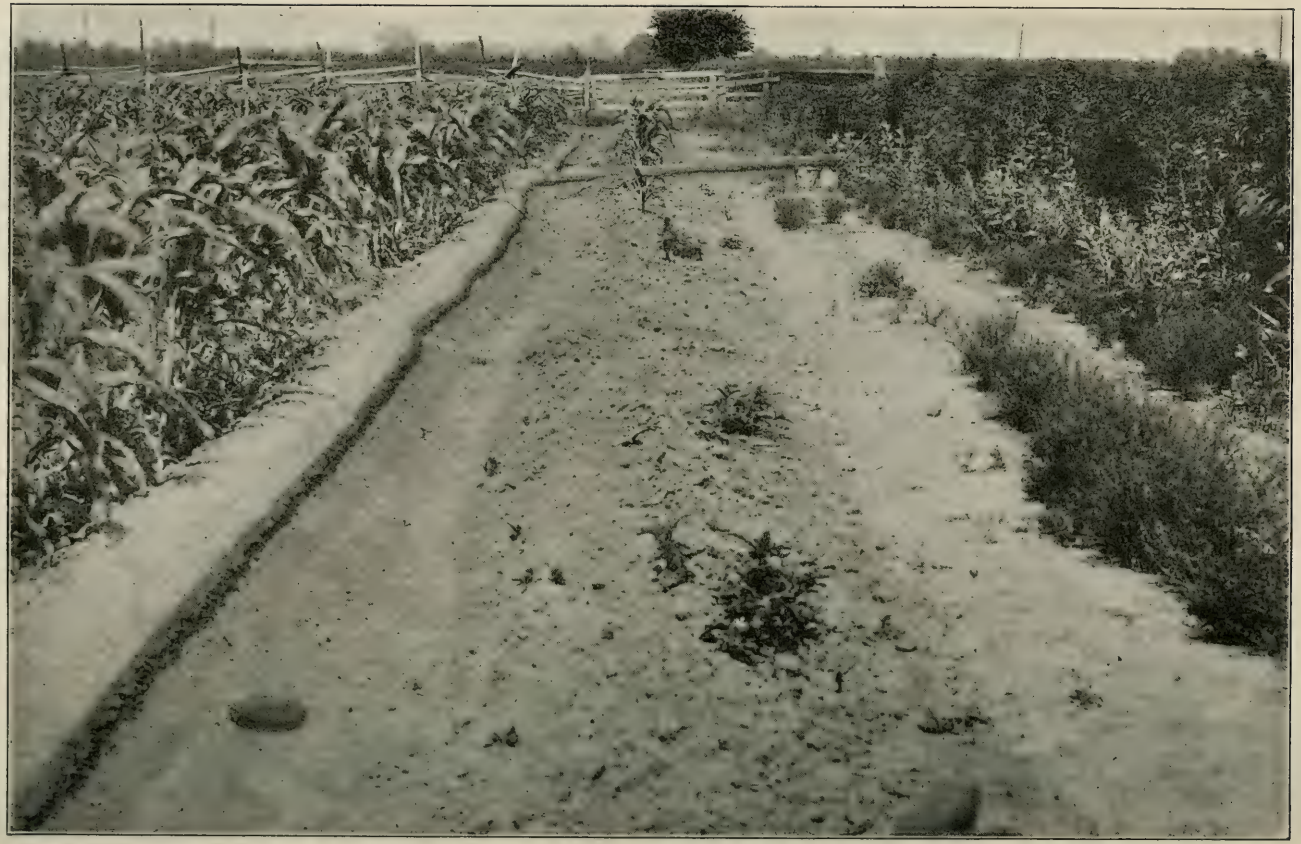

Fig. 2. A creosote barrier 100 per cent. effective. Line of creosote at edge of ridge, post-holes at bottom. Over 10 bushels of bugs were caught along three-fourths of a mile of this line. Bugs came through hedge at right from heavily infested wheat-field.

edge of the wheat field until a very dusty furrow is formed, out of which the bugs can not climb. On certain soils in dry weather this will make a good barrier, but it requires constant labor to maintain it, and if it is used, materials for one of the above-mentioned barriers should always be ready for use in case rain makes the dusty furrow passable to the bugs.

Fig. 3. Seven bushels of chinch-bugs in the sacks, caught along a half mile of barrier in one week.

Barriers in General

It will generally be necessary to maintain a barrier for eighteen days to three weeks from the time the bugs start to leave the wheat. On the average a fifty-gallon barrel of creosote will be required for each half-mile of barrier, or about twice as much coal-tar.

After a barrier is once made it will need, afternoons, the work of one man for each mile. Forenoons the bugs are not active except on cloudy days, and usually very little attention need be given to the barrier before noon.

For catching the bugs a line of post-holes about twenty to fifty feet apart should be dug along the side of the barrier towards which they are coming. These should be from eighteen inches to two feet deep, and have the tops flared and kept dusty. The dust prevents the bugs from getting a foothold, causes them to fall in on arriving at the holes, and, once in, to stay there.

The bugs in the holes should be killed each evening. This may be done by pouring a little kerosene into the holes or by tamping.

The post-holes are necessary with any barrier except the dusty furrow, and their effectiveness is shown by the fact that seven to ten

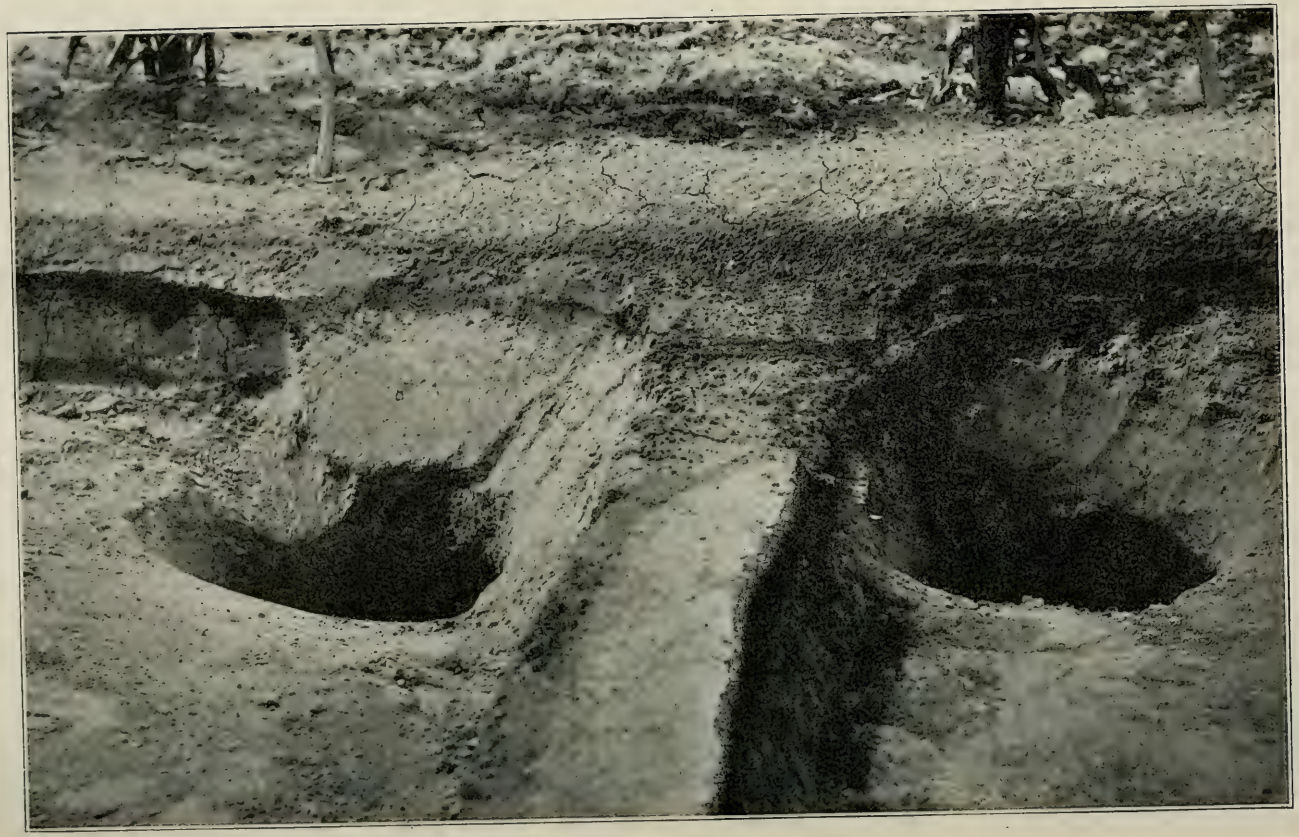

Fig. 4. Post-hole trap. Tops of the holes flared to hold dust.

bushels of bugs have been caught in them in one week along a half-mile of barrier.

Spraying

If a barrier has not been maintained between an infested field of small grain and corn, and the bugs have massed on the first rows of corn, it is sometimes possible to kill them by spraying with some contact poison. A strong tobacco solution containing 40 per cent. of nicotine, for example, "Black Leaf 40," may be used at the rate of 1 tablespoonful to a gallon of water in which an ounce of laundry soap has been dissolved, or kerosene emulsion in a 10-per cent. dilution will serve the same purpose, but it is very likely to injure the corn.

To make this emulsion, dissolve half a pound of laundry soap in 1 gallon of hot soft water and, while the water is still hot, add 2 gallons of kerosene (coal oil) that has been slightly warmed. Churn the water and oil together thoroughly for at least ten minutes, either by pumping it forcibly back into itself or by vigorously stirring with a bundle of twigs or broom. When finished, it should have the appearance and consistency of thick cream, and it can then be kept for some weeks if put in closed containers. This is the stock emulsion. For a 10-per cent. mixture, use 3 parts to 17 of water.

With either of these sprays it is necessary to hit the bugs in order to kill them, as they obtain their food, not by eating the tissues of the plant but by sucking its juices; therefore, spraying the surface of the plant will not affect them.

It should be kept in mind always that the chinch-bug feeds only on crops belonging to the grass family, and that such crops as corn, sorghum, and broom-corn should be placed as far as possible from infested fields of small grain, with intervening crops belonging to some family not susceptible to chinch-bug attack.

Urbana, Illinois, June 3, 1919.

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